

Reactive-Separator Process Unit for Lunar Regolith, Phase I

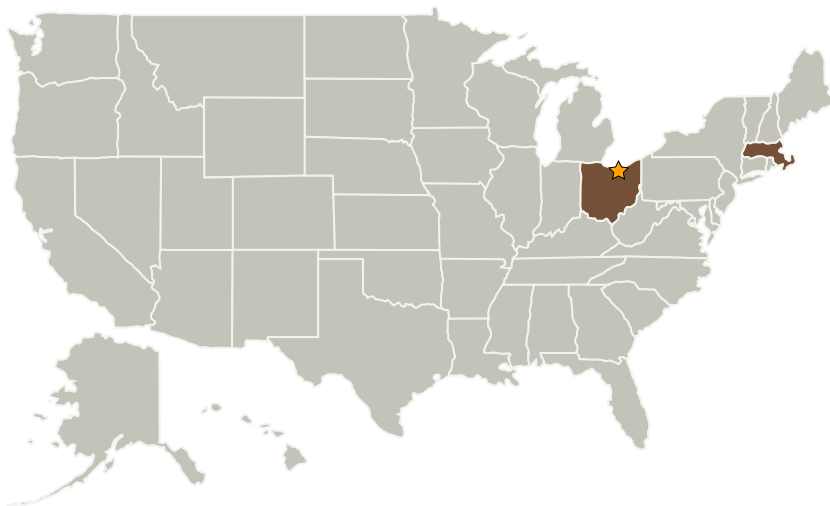
Completed Technology Project (2009 - 2009)



Project Introduction

NASA's plans for a lunar habitation outpost call out for process technologies to separate hydrogen sulfide and sulfur dioxide gases from regolith product gas streams. A low-pressure drop separation unit is needed to remove these sulfur compounds from regolith process streams that is compact and lightweight. To this end, Reactive Innovations, LLC proposes to develop an electrochemical reactive-separation unit to selectively bind and remove the sulfur compounds into a separated stream of sulfur-based compounds. During the Phase I program, we will develop and demonstrate an electrochemical reactive-separation platform that binds sulfur compounds via a charge transfer process to a redox carrier that is subsequently transported across a membrane separator releasing the sulfur components. In this effort, we will demonstrate the redox carrier for binding and releasing sulfur components, develop and assess electrodes that are corrosion resistant to the sulfur compounds, and culminate with a prototype reactive-separator unit design and evaluation for removing sulfur components from regolith streams. By the end of the Phase I effort, this lunar regolith reactive-separator unit will be at a Technology Readiness Level of 3 with a Phase II program delivering an operational reactive-separator at a TRL of 4-5.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Reactive Innovations, LLC	Supporting Organization	Industry	Westford, Massachusetts

Primary U.S. Work Locations

Massachusetts	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
 - └ TX07.1 In-Situ Resource Utilization
 - └ TX07.1.3 Resource Processing for Production of Mission Consumables